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## CONTINUOUS INDUSTRIES

BY Mr. THOMAS SCHLYTTER.

The proposal for a new Factory Inspection Law, which was placed before the Norwegian Storting last year by the Social committee of that parliament, contained a provision for a Maximum Working Day:

- 1) of 10 hours for industrial workers generally, and
- 2) of 8 hours for
  - a) unhealthy industries — industries which should be considered as such to be decided by the King.
  - b) industries or part of industries working regularly with day and night shifts.
  - c) underground work in mines.

Both these proposals ultimately failed. They gave rise, however, to a vigorous discussion of the problem of a Legal Maximum Working Day. The interest chiefly centered on the industries running on the continuous night and day work system, and this class includes the principal large Norwegian export industries with a considerable percentage of all industrial workers in Norway.

The desirability in itself of adopting the 8 hour day for such industries — which in most cases would mean 3 shifts of 8 hours instead of 2 shifts of 12 hours — was not actually denied from any important quarter, the chief argument against the proposal being that it would place the Norwegian industries at a disadvantage in international competition.

The Norwegian section, which had just been formed, then decided to appoint a special committee<sup>1</sup> to investigate this matter and to collect for comparison whatever information

<sup>1</sup> Professor N. Rygg, Mr. Richard Hansen, secretary Norwegian Labourers Union and the author.

would be available concerning the working time and shift systems in the continuous industries in the more important countries.

After having consulted the International Labor Office this committee addressed the following questions to the sections of the various countries:

- 1) Which are in your country the principal industries running on the day and night work system?
- 2) a) How many men are working on alternate day and night shifts?
- b) How many of these are working 8 hours and how many have the longer shift?

On account of the different ways in which the Labor Statistics of the various countries are collected and arranged in many cases no comparable statistics could be obtained. It may be stated, however, that the night and day shift system generally is used in the same industries in most countries, both in such industries where continuous work may on the whole be considered necessary, and those where it is not.

The shift systems in the different industries vary almost indefinitely, but on the whole the two main types are: 2 shifts of 12 hours working day (night) or 3 shifts of 8 hours each. And the 12 hour shift still largely predominates in all countries for the continuous processes.

From the annexed table it will be seen what information we have been able to collect — mostly thro' the courtesy and assistance of the national sections of our Association. This table is far from complete; it may, however, serve as a basis for further investigation and work on the subject.

In the United States practically all workmen in the continuous departements of the Iron and Steel Industry have the 12 h. shift, and the situation in most countries in Europe is the same. In England, however, more than half of all the iron and steel is made on the three shift system (8 hours), and there is difference of opinion as to whether the 2 shift or 3 shift in the long run is the more economical.

In Europe in the Paper, Cellulose and Wood Pulp industries the 2 shift system is universal in all countries. In the United States on the contrary more than half of the factories have all their shift workers on the 3 shift system.

In the Scandinavian countries and in England continuous processes in Gasworks are on the 8 hour shift (3 shifts), while in Austria, Belgium and other countries this work is still generally done with two 12 hour shifts.

These data show what might be obtained by international

comparison. What is possible in one country ought to be possible in others.

The following abstracts — being characteristic of the situation — may be cited from the replies of the national sections to our questions:

The Belgian Section writes:

«Il y a probablement 10 pour cent des ouvriers industriels qui travaillent par équipes alternant le jour et la nuit.

L'immense majorité de ces ouvriers travaillent en deux équipes, soit 10 heures environ de travail effectif.

Le nombre des ouvriers travaillant 8 heures (en trois équipes journalières) est infime.

J'ajoute que la généralisation du système des trois équipes n'est pas prochaine en Belgique. L'opposition patronale serait très forte.

Au contraire, la journée de 8 heures dans les mines (mais non par trois équipes) est en train de se généraliser, notamment sous l'action de notre nouvelle loi».

English Section: (in referring to the interesting report on the 8 hour shift in England by Miss S. Sanger).

«The eight hour shift is the exception rather than the rule in this country».

German Section:

«Im Kohlenbergbau bildet in Rheinland und Westfalen die achtstündige Schicht die Regel. Dagegen sind längere Arbeitszeiten im Kohlenbergbau Oberschlesiens und Sachsen sowie im Erzbergbau üblich. In der Grossseisenindustrie bildet die 12 stündige Schicht die Regel, die 8 stündige die Ausnahme.

American Section:

«No thorough investigation has ever been made in America into the conditions of long hours in the continuous industries.

There will be available in a short time, however, a careful study of the iron and steel industry, where conditions are probably at their worst. In this industry men work regularly a twelve-hour shift seven days in the week, which means twenty-four hours without rest every two weeks, when the shifts are changed from day to night».

Special attention should be called to the excellent collection of statistics and facts concerning continuous industries contained in the Labour Statistics of Sweden, Austria, and Holland. In Denmark the Department of the Interior in 1906 ordered a special investigation to be made by the Labour Inspection Office into the working time in continuous indu-

stries, and a very instructive report on the subject was published. In Denmark, however, comparatively few industries are «continuous». In Sweden on the contrary as well as in Norway a large percentage of all workmen are employed on alternate day and night shifts.

#### Norway:

The figures for Norway in the table are only approximate, no official statistics existing. These figures are mostly based on information obtained from the Labor organisations. When the last industrial census of 1909 will have been compiled accurate figures will be available.

In Norway as in most countries the workers in continuous industries who enjoy the 3 shift system are comparatively few, 10 and 12 hour shifts being the rule.

Before discussing the separate industries a few general remarks will be useful.

It is in many cases difficult to decide whether an industry should properly be classed as continuous or not. Some industries must practically be continuous; in others the work has been arranged in shifts more as a matter of expediency and to obtain economy and efficiency than on account of any technical necessity. In this latter class some works may run continuously and some not, and during rush times night shifts are more used than when business is slack. This is for instance the situation in Saw Mills.

In the Danish report the continuous industries are divided into 2 classes: 1) industries running continuously the whole year and 2) industries having regular night and day work only part of the year (Sugar Industry). In the Swedish, Austrian and Belgian Labor Statistics, however, the industries using day and night shifts in the regular course of work are treated together as continuous, whether running continuously the whole year or not. In this connection it is difficult to draw the line between special night work such as may f. i. take place in the canning industry and the work of more or less regular night shifts.

The question of regulating the working time in continuous industries also necessarily branches off into the subject of night work generally.

The figuring of the «shift» and working hours may be made in several ways. The 3 shift system necessarily means 8 h. shifts. But the 2 shift system does not always mean 12 hour shifts except in industries which are continuous in the strict sense of the word — where the process itself is con-

tinuous. In such factories the resting time as a rule is irregular and is taken when the work allows, so that the actual working time is difficult to determine.

In the industries, however, where 2 shifts have been adopted more for the sake of economy in production, there are generally regular rests for meals with complete stopping of work, actual working time in such industries in Norway being as a rule 10 hours on each shift, which must also then be considered the duration of the shift.

Other important questions in this connection are Sunday work in continuous industries and the various systems used in changing shifts.

The principal industries in Norway to be considered under the subject of continuous industries may be grouped as follows:

Class 1: Industries which are continuous for technical reasons:

Wood Pulp

Paper

Cellulose

Flour Mills

Cement & Brick Works

Smelters

Electro Chemical and Electrometallurgical Industries.

Gasworks and Power Plants.

Part of these industries are what may be termed

«Absolutely continuous», i. e. run weekdays *and* Sundays.

Class 2: Industries which are customarily continuous — in order to obtain cheapness of production:

Saw Mills

Mines

Metal Industry.

Class 1: Industries of this class are practically speaking necessarily continuous.

Wood Pulp, Paper Mills and Flour Mills are kept running from Sunday 10 o'cl. p. m. till Saturday 6 p. m. according to the regulation of the Factory Inspection Act.

In Cellulose Mills part of the factories work on Sundays, and for Smelters, the Electro Chemical Industries, Gas Works and Power Stations this is the case with practically all work connected with the process itself.

These latter industries have until Jan. 1. 1910 been working on Sundays with dispensation from the Factory In-

spection Office, and as a rule the condition for such permission has been that the 3 shift system be introduced

For almost all continuous work which does not stop on Sundays 3 shifts have in this way been established, the only exceptions being the Cement Industry and one or two Smelters, where 2 shifts of 12 hours including Sunday are still used.

Consequently the workmen in Norway who have the 8 hour shift are those employed in the processes or industries which we have termed «absolutely continuous» i. e. which do not stop on Sundays. The others have the long shift.

The new Factory Inspection Act of 1909, which went into force the first of this year, expressly permits Sunday Work for «factories or part of factories where the process must be continuous» (§ 27) and leaves it to the Factory Inspection Council, which is appointed partly by Parliament and partly by the Departement of Commerce and Labour, to decide which such factories are. With this decided, however, no condition can any more be imposed for the permission to work on Sundays. On the other hand § 29 contains special provisions for work «in unhealthy or dangerous industries or which may easily lead to overexertion». For such work a maximum working day of 8 hours may be imposed. The King after hearing the Factory Inspection Council shall make out a list of such industries. This, however, has not yet been done, and it is not easy to say how the rule will work in practice. Possibly shift work continuous weekdays and Sundays may be classed as liable to produce overexertion. In any case there is so far no tendency to go back to the 2 shift system for such industries where 3 shifts have been established.

In the Wood Pulp Industry, Paper Mills, Flour Mills and those parts of the Cellulose Mills which are not «absolutely continuous» (3 shifts and running Sundays) 2 shifts of 12 hours are the rule.

For such work, however, as can be stopped without difficulty 10 hour shifts are general.

Class 2. These industries have shifts, not because it is necessary, but in order to obtain cheapness of production and greater output. Here 2 shifts of 10 hours actual working time are generally used, as in Saw Mills, but other shift systems also obtain. During periods of active demand these industries use the continuous work system to a much greater extent than otherwise.

There are also establishments of the same kind as those

mentioned in this class where night work is not used at all.

Work in Mines in Norway mostly come under class 2 as customarily, continuous with generally 10 h. working time on each shift; but some departments of this industry must be put in class 1 as necessarily continuous.

The Sydvaranger Co. (iron ore) uses 8 h. shifts in the mine, in the concentrating process and in loading the vessels. These departments work 16 or 24 hours (2 or 3 shifts) At this mine most of the men are on the 8 hours.

The Dunderlandsdalen Co. (also iron ore) is not working at present but is rebuilding its plant. About 15 % of the men had 8 h. shifts. The new concentration plant will be in continuous operation 6 days in the week and will, we are informed, be worked on the 8 h. system. This means that more men than before will get the shorter shift. In the mine and the other departments, however, the 10 h. shift will be maintained.

Kongsberg Silver Mines use a day shift of 10 hours and a night shift of 8 hours.

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There are several reasons why it must be considered especially desirable to have the working time in continuous industries regulated by law.

To change constantly from day to night work and vice versa as is the rule in these industries is in itself a severe strain, and it unsettles the domestic and social life of the workmen. For one shift to work always during the night would be still worse. Moreover, many shift workers have a continuous working day of 16 or even 24 hours when changing shifts. At present those employed in continuous industries work on the whole longer hours than in other industries. In Norway in the other industries  $9\frac{1}{2}$ —10 hours working day is general.

There has on several occasions been a good deal of discussion with regard to the figuring of actual working time for the continuous processes. Of course the hours of actual work may not always coincide with the duration of the shift. If the men have a 12h. shift they must at least get something to eat, but this is often done while the machinery is running or the process is being watched. Unless there is regular and fixed resting time during which the men are permitted to leave their work and the factory, it would seem natural to figure the whole length of the shift as working time.

In these industries shifts of 12 hours are the rule, while it would be reasonable and just, that on account of the alternate day and night work, the working hours for continuous industries should be somewhat shorter than for other work. The explanation of the present situation is, that for continuous work the choice has been, generally speaking, between 2 shifts of 12 hours and 3 shifts of 8 hours. There has been no room for gradual shortening of the working day, and the 12 hour day (shift) still obtains, while in other industries the working day has been gradually shortened.

Let us now consider what would be the effect of the introduction of a maximum working day of 8 hours for the continuous industries.

A provision that all industries or part of industries to get permission to run nights for any length of time, (for instance 30 days in the year), should establish shifts of 8 hours maximum working time, would be most effective. This would probably tend to abolish night work, where it is not really necessary, and for such industries where night work is necessary or very important, it would establish humane conditions of work. For all industries which must be continuous, this would mean the establishment of the 3 shift.

The new Norwegian Factory Inspection Act of 1909 permits the employment of youths under 16 during the night for a maximum of 8 hours in industries, «where the kind of work is such as to necessitate night work or where night work is customary» (§ 26). Otherwise night work for youths under 16 is prohibited. A similar provision for all workmen would also go a long way towards making the 8 hour shift general. For the industries in class I it would make 3 shifts necessary; for class 2 the result might be 2 or 3 shifts of 8 hours each, or it might lead to the establishment of a day shift of 10 or 12 hours and a night shift of 8 hours. And this would also be a great improvement. It should be born in mind, that the large majority of night workers are at present shiftworkers changing regularly from day to night and vice versa.

The Social Committee of the Norwegian Parliament proposed an 8 hour legal working day for industries or part of industries using day and night shifts regularly (see p. 1).

As already pointed out it is difficult to decide what should be considered «regularly». Especially so for industries which sometimes may work continuously and at other times not. 30 days night-work in the year might do.

It would seem natural that the 8 hour shift should be

imposed for those periods only where night work is used and only for such departments as work continuously.

In Norway the most important continuous industries are the Wood Pulp, Cellulose and Paper Industries, which are typical for class I.

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The Norwegian Labor organisations are unanimously in favor of the 8 h. shift; while the employers opposed the measure on the ground of international competition.

The Norwegian Employers' Association, on account of the action of the Norwegian Section in taking up the question, at the beginning of this year addressed the following questions to their members in the industries of continuous work:

- 1) Are you at present using 8 h. shifts in your factory or part of your factory, and if so to what extent?
- 2) What effect would it have on your factory, if the 8 h. working day (shift) should be established internationally i. e. established in all countries?
- 3) Which exceptions from the 8 hour day would you eventually consider necessary?
- 4) If the 8 h. working day (shift) should not be established internationally, which countries would you consider as necessary to adopt the measure in order to make it possible for Norway to join?

The following is an abstract of the replies, which are interesting as showing the attitude of the employers towards the reform:

Most of the firms pointed out, that the establishment of the 8 hour shift would materially increase the cost of production, and that it would be difficult during the transition period to find enough skilled workers.

It is, however, the general opinion that if the reform could be established by international agreement, it would not be detrimental to the Norwegian industries.

There are firms holding the opposite view, but these are exceptions. A few cases may be cited:

One big mining company, which uses 8 hour shifts to some extent, points out that in one of their departments it is very advantageous to use 2 shifts of 10 hours, the remaining 4 hours being used for changing plates in the crushers, repairing and various other work.

A small oil refinery (10 men in the continuous department) contends that 8 hour shifts would be very detrimental.

A Wood Pulp Factory, making hand-made pasteboard, thinks that the 8 hour shift would make it impossible for this kind of board to compete with the machine-made pasteboard.

These objections are not of a very serious nature.

As exceptions to a general rule of 8 hour shifts, which are considered necessary, may be mentioned:

- a) Right to give dispensation in emergency and other special cases; and with regard to perishable goods.
- b) Watchmen.
- c) The Flour Mills consider that loading and discharging of vessels should be excepted.

The Mine Owners' Association contends that the 8 hours should eventually be figured exclusive of descent and ascent. This question will be well known from the discussion of the 8 h. day in Coal Mines.

The countries which it would be essential for Norway to have join in a convention are the following:

For Wood Pulp and Cellulose: Sweden, Finland, Germany, Austria, United States and Canada.

For Paper: Great Britain, Sweden, Finland, United States and Canada.

For Iron & Mining: Principally Sweden, Great Britain and United States.

For Cement: Germany, Denmark, Sweden, Belgium, Great Britain.

For the Electro Chemical Industry: Sweden, Germany, Italy.

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There is no prospect in Norway of the 3 shifts being adopted by agreement between employers and workmen's organisations, nor is legislation on the subject likely. And in other countries the situation seems to be the same.

International action is therefore necessary to obtain better and more humane conditions of work in these industries.





# Kontinuierliche bedrifter

# PRINCIPAL CONTINUOUS INDUSTRIES

(using regular day-and nightshifts)

Industries à marche continue

Comp. by Mr. Thomas Schlyter

## Kontinuierliche Industrien

Principal Industries using regular day & night shifts approximately in the order of their importance in each country

Number of shiftworkers in the following industries

Wechselschichtarbeiter nach Industrien verteilt

Des ouvriers en relais dans les industries suivantes

Antal skiftarbejdere fordelt efter bedriftergrupper

Total Number

Gesamtzahl

Nombre des ouvriers

Samlet Antal

Countries

Länder

Pays

Land

Austria 1907

Belgium Census 1896 & 1903

Denmark 1906

Germany

Hungary

Italy

Netherlands 1909

Norway 1909

Spain

Switzerland

Sweden 1905

United Kingdom

United States

Kontinuierliche Industrien ungefähr in der Reihenfolge ihrer Bedeutung

Shift Systems and working hours

Schichtaufteilung und Arbeitszeit

Équipes et heures de travail

Skiftsystem og Arbejdstid

Alimentary Products

Mines & Metal Industry

Chemical Industry

Wood & Paper

Gas Works

Metal Industry

Mines

Glass Industry

Sugar Factories

Chemical Industry

Gas Works

Sugar Factories

Paper Mills

Brick & Cement Works

Flour Mills

Chemical Industry

Wood & allied Industries

Paper, Pulp,

Saw Mills

Metal Industry

Textile Industry

Brick and Glass

Power Stations

Mines & Smelters

Metal Industry

Glass Industry

Chemical Industry

Paper & Wood Industry

Alimentary Products

Sugar & Flours

Mines

Metal Industry

Chemical Industry

Brick Works

Gas Works

Power Plants

Flour Mills

Sugar Factories

Chemical Industry

Gas Works

Wood & allied Industries

Paper, Cellulose,

Pulp & Saw Mills

Mines

Cement & Brick Works

Flour Mills

Chemical Industry

Metal Industry

Gas Works

Mines & Smelters

Metal Industry

Chemical Industry

Paper Industry

Glass Works

Gas Works

Metal Industry

Mines

Paper, Pulp, Cellulose

Glass Industry

Wool & allied Industries

Pulp & Cellulose

Saw Mills

Wood Works

Metal Industry

Mines & Smelters

Cement Fact.

Brick Works

Glass Works

Alimentary Ind

Sugar, Lact.

Flour Mills

Chemical Industry

Gas & Power

Plants

Miscellaneous

working on 2 shift system

12 hours

working on 3 shift system

8 hours

working on 2 shift system

12 hours

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